Castle Gate Holding Company
Castle Gate Mine
Sowbelly Gulch
C/007/004

Phase II Bond Release Application

May 2002

Application for Phase II Bond Release
Sowbelly Gulch No. 5 Mine
Castle Gate Holding Company
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C/007/004

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Introduction

Castle Gate Holding Company, formerly AMAX Coal Company, completed backfilling, grading, seeding and mulching on about 18.2 acres of the Sowbelly Gulch disturbed area in the fall of 1995. The Utah Division of Oil, Gas and Mining approved AMAX's Application for Phase I Bond Release on January 30, 1997.

All earthwork and revegetation have been completed in Sowbelly, except for the removal of an electrical substation and access road. Reclamation of these areas will be completed when they are no longer necessary.

The Sowbelly site and the No. 5 Portal were rehabilitated portions of the old Spring Canyon Coal Company No. 5 Mine. The No. 5 Mine was accessed through Sowbelly Canyon which lies approximately four miles west-northwest of Helper, Utah. Approximately 21 acres were affected by mining-related surface operations prior to 1977. Most of the affected area was used for storage and personnel access through Portal No. 5 which continued until the end of 1988.

Since the 21.0 acres in Sowbelly Canyon were disturbed by mining prior to the enactment of SMCRA, no topsoil or soil resource material was salvaged from the site. The existing and undisturbed soils at the site were used for reclamation as topsoil and substitute soil material. The existing soil resource materials were evaluated using DOGM's guidelines for topsoil and overburden.

Sowbelly Gulch was originally reclaimed in 1993-1994, but in the fall of 1995, about two-thirds of the area was reworked. Originally, the operator had installed contour furrows to trap moisture, but the reworked areas were gouged. The gouges vary but are approximately one to two feet deep and about four to six feet across. This method of water harvesting is considered superior to contour furrowing. The gouges trap water and thus increase the amount of soil moisture and the ability for plants to establish and survive. Gouging combined with other treatments implemented by the permittee are the best revegetation methods for the area.

Vegetation should be adequate to control erosion assuming the cover will be the same as at nearby abandoned mine reference area where the existing vegetation is controlling erosion. The mining and reclamation plan said the diversity index used to compare reference and reclaimed areas will be used to show revegetation success for the parameters of diversity, seasonal characteristics, permanence, and utility for the postmining land use. The seed mix used should result in diversity at least as great as in the reference area.

Vegetation Information

Vegetation sampling (Appendix 1) on the reclaimed and reference area in Sowbelly Canyon was conducted during the growing season of 2000 as a means to monitor the success of the revegetation and to determine whether on not Phase II bond release was possible.

The vegetation sampling report presents the methodology and data as required by the mining and reclamation plan. The data show that the revegetation at Sowbelly Canyon is progressing well and with the statistical, similarity, and diversity comparisons Phase II bond release is justifiable.

Comparing background conditions (approved Reference Area), it is shown that the cover value, paramount to erosion control, of the reclaimed area is not statistically dissimilar that the reference area.

Sediment Yield Information

To demonstrate that the reclaimed area in Sowbelly Canyon will generate the same amount or less sediment than the undisturbed condition, the revised universal soil loss equation (RUSLE) was used (Appendix 2).

The revised universal soil loss equation takes into several factors in determining the sediment yield for an area. The factors involved are: 1) rainfall-runoff erosivity, 2) soil erodibility, 3) length of slope, 4) cover management (vegetation), and 5) support practice.

The RUSLE demonstrates that the reclaimed area sediment yield in Sowbelly Canyon is less than the sediment yield under undisturbed conditions.

Conclusion

As authorized by R645-301-880.300, Phase II Bond Release should be approved based on the Permittee meeting vegetation and water quality requirements in accordance with the mining and reclamation plan.

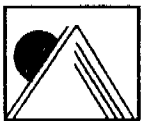
Appendix 1

Vegetation Monitoring
For Phase II Bond Release
In Sowbelly Canyon

VEGETATION MONITORING
FOR PHASE II BOND RELEASE
IN SOWBELLY CANYON

2000

FOR
PLATEAU MINING CORPORATION



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Fieldwork: August 2000
Report: February 2001

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VEGETATION MONITORING FOR PHASE II BOND RELEASE IN SOWBELLY CANYON

INTRODUCTION

Objectives for Monitoring

Disturbed areas of Sowbelly Canyon (also known as Sowbelly Gulch) have been reclaimed and reseeded with the 'final' plant seed mixture. The vegetation has been established to a level that may warrant Phase II bond release through the State of Utah, Division of Oil, Gas and Mining (DOGM). Vegetation sampling was conducted in the growing season of 2000 as a means to monitor the success of the revegetation and to determine whether or not Phase II bond release would be plausible.

Brief History

Sowbelly Canyon is located within the Wasatch Plateau approximately 4 miles west-northwest of the city of Helper, Utah. This canyon has been the site of mining activities for nearly 100 years. Spring Canyon Coal Company was one of the first mining companies in the canyon, conducting their operations between 1890 and 1970. Subsequently, McCulloch Oil purchased the site followed by Franklin Real Estate, Price River Coal and Castle Gate Coal Company. Plateau

Mining Corporation currently owns the property. In recent years the disturbed areas of Sowbelly Canyon have been reclaimed with final seeding accomplished in Fall 1995.

General Site Description

The average elevation of the Reclaimed and Reference Areas of Sowbelly Canyon is approximately 7,000 ft above sea level. The canyon sides are dominated by pinyon-juniper and Gambel's oak/grass plant communities. Most of the Reclaimed Areas are located near the canyon bottoms that, prior to disturbance, were probably once dominated by Gambel's oak, sagebrush and grass communities. During reclamation activities, a drainage channel has also been recreated at the canyon bottoms. The Reclaimed Areas were seeded with native plant seeds. In addition, containerized plant species such as serviceberry (*Amalanchier utahensis*), chokecherry (*Prunus virginiana*), willows (*Salix* spp.), and Wood's rose (*Rosa woodsii*) have been transplanted along this channel.

Reference Area

A general Reference Area to be used as a standard for final revegetation success was chosen at a much earlier date. The Mining and Reclamation Plan (MRP) states that "the AML Reference Areas shown on Exhibit 9-6 will be used to evaluate previously mined areas". Because the AML (Abandoned Mined Lands) areas are relatively extensive, at least to be sampled as one Reference Area, a biologist from DOGM along with an official from Plateau Mining Corp., chose a subset

portion of the AML areas that would be representative and therefore be used as the Reference Area for the reclaimed site in Sowbelly Canyon. This Reference Area was located down-canyon (or south) and very close to the Reclaimed Areas.

METHODS

Quantitative and qualitative data were taken from the vegetation of the Reclaimed and Reference Areas in Sowbelly Canyon. Sampling was conducted in August 2000. Methodologies used for sampling were performed in accordance with the guidelines supplied by DOGM.

Transect and Quadrat Placement

Random/regular placement of sample quadrats were designed as an attempt to provide unbiased accuracy of the data compiled. This was accomplished by establishing one long transect line along the entire length of the Reclaimed Area. This line was placed in the lowest portion of the reclaimed drainage system. At regular intervals along the drainage transect line, random numbers were generated and used to measure distances at right angles from the drainage and to determine sample locations. Whether these random numbers were odd or even determined which side of the drainage (east or west) a given quadrat was placed. The random number selected could be high enough to place quadrats to the lateral limits of the Reclaimed Areas and all areas in-between. This insured that the sample quadrats were placed randomly over the entire study area

in an attempt to adequately represent the site as a whole. The sample points that were placed randomly in the drainage (or potential riparian area) were marked on the raw data sheets so they could be studied separately if desired.

Cover, Frequency and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "A Utah Flora", (Welsh et al. 1993).

Sample Size & Adequacy

Sampling adequacy was calculated using formula given below.

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

nMIN	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

The values used for "t" and "d" insured that sample adequacy was met with 90% confidence

within a 10% deviation from the true mean.

Diversity & Similarity Indices

There are several well-documented methods to assess diversity and similarities in plant communities. The "Motyka Index" is a modified form of the "Sorenson Index", both similarity indices. This index was used on the data and the equation is shown below:

$$IS_{MO}=(\frac{2MW}{MA+MB})x100$$

where,

MW = $\sum$ of the smaller quantitative values of species of two communities,
MA = $\sum$ of the quantitative values of all species in one community,
MB = $\sum$ of the quantitative values of all species in another community.

Two diversity indices have been reported in this document for the Reclaimed and Reference Areas. MacArthur's Diversity Index is an effective diversity measurement and is computed using the following equation:

$$1/\sum pi^2$$

where,

pi is the proportion of sum frequency contributed
by the *i*th species in the sample area of concern.

The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which

frequency of occurrence was equitably distributed among those species.

Another diversity measurement was provided that shows the average number of species encountered at each quadrat – or a measure of species diversity.

Photographs

Color photographs of each sample area were taken at the time of sampling and submitted with this report.

Raw Data

The raw data for total cover, cover by species, frequency and composition were also submitted in the Appendix of this report which should facilitate future scrutiny of the data and further statistical testing if desired.

RESULTS

Reclaimed Area

Results from sampling the vegetation of the Reclaimed Area demonstrates that the total living plant cover was 47.44% and comprised of 53% grasses, 37% forbs and 10% shrubs (Table 1).

Although many species contributed to the total living cover, the dominate forbs were yellow sweet clover *(Melilotus officinalis)*, blueleaf aster (*Aster glaucodes*) and Louisiana wormwood (*Artemisia ludiviciana*). The dominate grasses present in the quadrats were thickspike wheatgrass (*Elymus lanceolatus*), western wheatgrass (*E. smithii*) and bluebunch wheatgrass (*E. spicatus*). The dominate shrub by a wide margin was rubber rabbitbrush (*Chrysothamnus nauseosus*). For a list of the species present in the quadrats that shows percent cover and frequency, refer to Table 2.

Reference Area

The Reference Area chosen to be a standard for revegetation success had a mean cover of 49.25%. Like the Reclaimed Areas, grasses dominated the site comprising nearly 60% of the total living cover. However, unlike the Reclaimed Areas, shrubs at 23% were the next most common lifeform followed by forbs at 18% (Table 3). The most common of all species was western wheatgrass followed by several other grasses including thickspike wheatgrass, and Indian ricegrass (*Stipa hymenoides*). The most common shrub species was fourwing saltbush (*Atriplex canescens*) followed closely by rubber rabbitbrush. Finally, the most common forb was Louisiana wormwood (Table 4).

Data Set Comparisons

Comparisons were made between the data of the Reclaimed and Reference Areas. Initially,

statistical tests were implemented comparing the total living plant cover of the two areas. A "Student's t-test" analysis suggested there was no significant difference between the Reclaimed Area cover when it was compared to the Reference Area ($p<.005$, Fig. 1).

FIG. 1. STUDENT'S T TEST - A Comparison Between the Reclaimed and Reference Areas at Sowbelly Canyon.

Reclaimed Area: $\bar{x}=47.33$; $s=12.92$; $n=80$

Reference Area: $\bar{x}=49.25$; $s=14.25$; $n=40$

$t = -0.699$; $df = 118$, SL: $p \leq .005$

Next, although achievement of final diversity standards are not required during this phase of bond release, the regulatory agencies usually requires some type of discussion about it as a means of monitoring species diversity. The Motyka Index was recommended to be used to compare species diversity in the Plateau's Mining and Reclamation Plan (MRP). Although this index is more of a 'similarity index' than a 'diversity index', it has been employed to compare the data sets. The MRP assigned the following categories to be used for comparisons in the Motyka Index:

Non-Weedy Shrub Cover,
Weedy Shrub Cover,
Native Perennial Grass Cover,
Introduced Perennial Grass Cover,
Non-Weedy Forb & Grass Cover,
Weedy Forb & Grass Cover.

FIG. 2. MOTYKA INDEX - A Comparison Between the Reclaimed and Reference Areas at Sowbelly Canyon.

$$IS_{MO}=\left(\frac{2MW}{MA+MB}\right)x100=89.728$$

When using the above categories and employing the Motyka Index, the similarity value between the two communities was 89.73% (Fig. 2).

MacArthur's Diversity Index was also employed to the data sets of the Reclaimed and Reference Areas. This comparison suggests that the total diversity of the Reclaimed Area is greater than that of the Reference Area (Fig. 3).

FIG. 3. MacARTHUR'S INDEX - A Comparison Between the Reclaimed and Reference Areas at Sowbelly Canyon.

$1/\sum pi^2 =$

Reclaimed Area: 11.379

Reference Area: 8.347

Still another method of comparing species diversity of two areas is to simply calculate the mean number of species present in the sample quadrats. This method also suggests that the Reclaimed Area is more diversity with respect to species than the Reference Area (Fig. 4).

FIG. 4. AVERAGE NUMBER OF SPECIES PER SQUARE METER- A Comparison Between the Reclaimed and Reference Areas at Sowbelly Canyon.

$\bar{x}$ NO. SPP/M^2 =

Reclaimed Area: 3.86

Reference Area: 3.15

DISCUSSION

Approval by the State of Utah of the Phase II bond release is dependent on several factors. One of the most important conditions is probably whether or not the reclaimed site is controlling erosional sediments, or as stated by the State Rules: "*No part of the bond or deposit will be released under this paragraph so long as the lands to which the release would be applicable are contributing suspended solids to streamflow or runoff outside the permit area in excess of the requirements set by UCA 40-10-17(j) of the Act and by R645-301-751*". Comparing "background" conditions (or in this case the approved Reference Area), it has been shown that the cover values, paramount to erosion control, of the Reclaimed Area is not statistically dissimilar than the Reference Area.

The State of Utah also encourages the collection of quantitative data that can indicates which plant species are growing on the Reclaimed Areas and how much (quantity) of each of these species are becoming established. Reporting cover by species and frequency enables one to portray this information as well as calculate community similarity, community diversity, and species diversity. One community similarity index suggested that the Reclaimed Area is quite similar to the Reference area with respect to cover of shrubs, perennial grasses, combined herbaceous species, and weeds. Two diversity indices suggested that the Reclaimed Area had greater diversity the Reference Area. These data analyses suggests that the revegetation at Sowbelly Canyon is progressing well and with the statistical, similarity, and diversity comparisons described above, Phase II bond reduction through the State of Utah is probably warranted.

TABLE 1: Total cover and composition summary for the Reclaimed Areas in Sowbelly Canyon.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	47.44	12.92	80
Litter	11.65	9.48	80
Bareground	25.04	14.08	80
Rock	15.88	12.47	80
COMPOSITION			
Shrubs	10.06	18.44	80
Forbs	37.16	27.88	80
Grasses	52.79	28.58	80

TABLE 2: Species cover and frequency summary for the Reclaimed Areas in Sowbelly Canyon.

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Artemisia tridentata	0.39	1.54	80	7.50
Atriplex canescens	0.44	2.98	80	2.50
Ceratoides lanata	0.31	1.99	80	2.50
Chrysothamnus nauseosus	3.50	8.42	80	21.25
Gutierrezia sarothrae	0.06	0.56	80	1.25
Kochia prostrata	0.19	1.67	80	1.25
FORBS				
Achillea millefolium	0.13	3.90	80	2.50
Artemisia ludoviciana	1.00	5.83	80	6.25
Aster glaucodes	4.73	11.33	80	23.75
Descurainia pinnata	0.06	0.56	80	1.25
Epilobium halleanum	0.06	0.56	80	1.25
Grindelia squarrosa	0.44	2.12	80	5.00
Hedysarum boreale	0.06	0.56	80	1.25
Kochia scoparia	1.63	6.46	80	10.00
Linum lewisii	1.91	3.90	80	27.50
Melilotus officinalis	7.48	11.59	80	60.00
Penstemon palmeri	0.44	1.62	80	7.50
Salsola pestifer	0.06	0.56	80	1.25
Sanguisorba minor	0.13	1.11	80	1.25
GRASSES				
Agropyron cristatum	0.38	1.73	80	5.00
Bromus carinatus	0.19	1.24	80	2.50
Elymus cinereus	3.88	7.42	80	33.75
Elymus lanceolatus	5.88	7.11	80	56.25
Elymus smithii	5.06	8.82	80	38.75
Elymus spicatus	5.00	9.05	80	35.00
Elymus trachycaulus	1.75	7.79	80	6.25
Hordeum jubatum	0.13	1.11	80	1.25
Poa secunda	1.81	5.43	80	17.50
Stipa hymenoides	0.38	1.73	80	5.00

TABLE 3: Total cover and composition summary for the Reference Area in Sowbelly Canyon.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Vascular Plants	49.25	14.25	40
Nonvascular Plants*	0.13	0.78	40
Litter	21.75	10.81	40
Bareground	10.70	10.77	40
Rock	18.30	14.96	40
COMPOSITION			
Shrubs	22.68	20.09	40
Forbs	17.73	20.53	40
Grasses	59.59	18.13	40

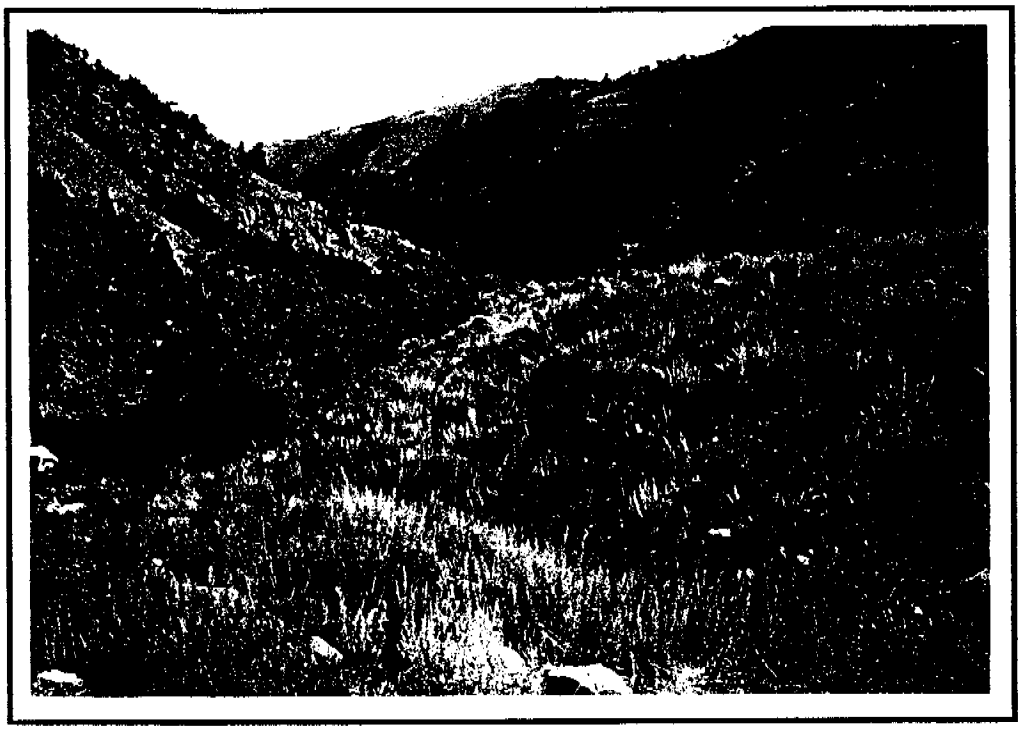
* Includes fungi.

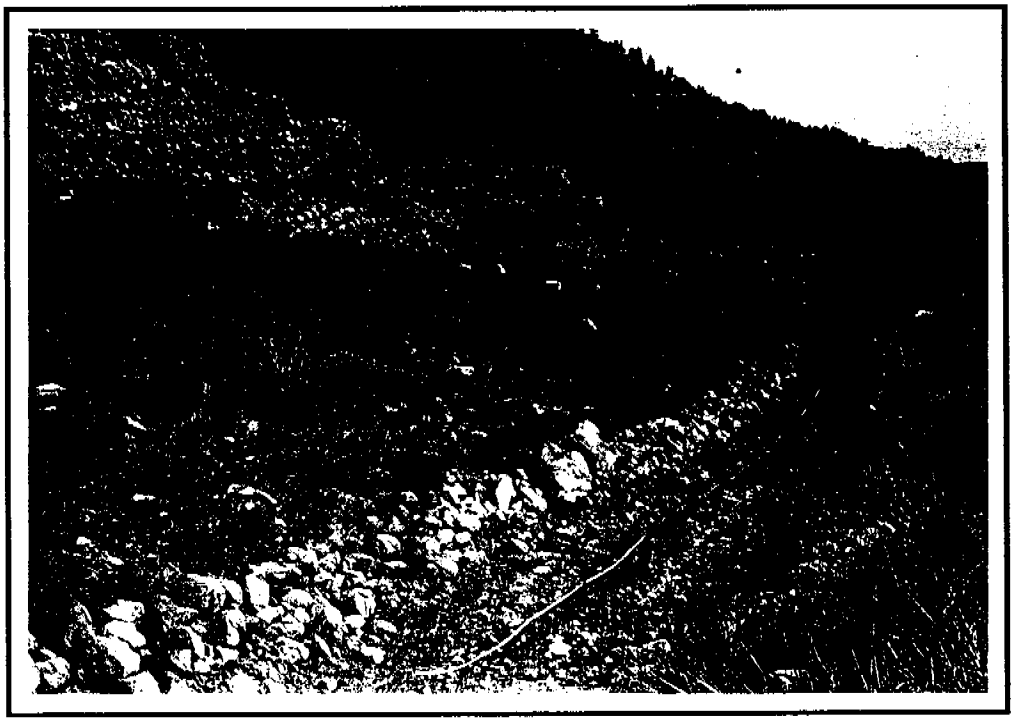
TABLE 4: Species cover and frequency summary for the Reference Area in Sowbelly Canyon.

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Artemisia tridentata	0.25	1.09	40	5.00
Atriplex canescens	6.25	8.86	40	40.00
Chrysothamnus nauseosus	5.38	9.58	40	37.50
FORBS				
Aster glaucodes	1.38	5.12	40	7.50
Artemisia ludoviciana	6.25	8.20	40	42.50
Descurainia pinnata	0.38	1.73	40	5.00
Grindelia squarrosa	0.13	0.78	40	2.50
Medicago sativa	0.25	1.09	40	5.00
GRASSES				
Bromus tectorum	1.88	6.77	40	12.50
Dactylis glomerata	0.50	2.45	40	5.00
Elymus hispidus	0.50	1.87	40	7.50
Elymus lanceolatus	6.50	9.10	40	55.00
Elymus salinus	1.25	7.81	40	2.50
Elymus smithii	11.38	12.89	40	52.50
Elymus spicatus	0.13	0.78	40	2.50
Poa secunda	0.63	3.90	40	2.50
Stipa hymenoides	6.25	12.18	40	30.00

COLOR PHOTOGRAPHS

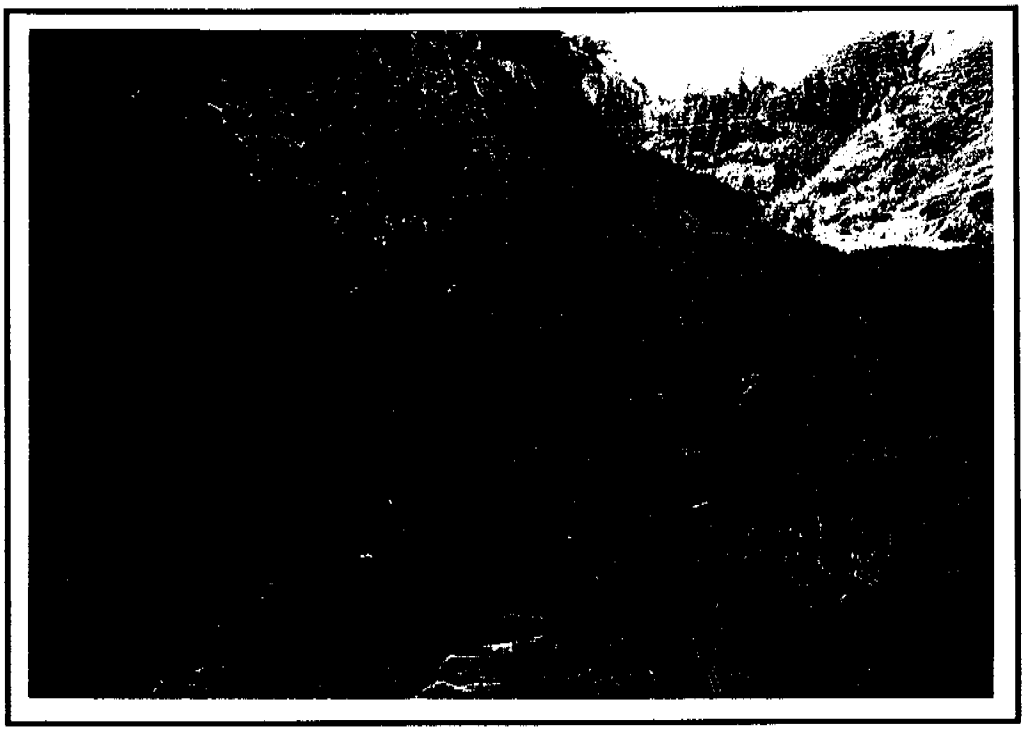
Reclaimed Areas





COLOR PHOTOGRAPHS

Reference Area



APPENDIX

Raw Data

Sowbelly
Reclaimed Area
Exposure: Variable
Slope: Variable
Sample Date: 23 Aug ' 00

R = Riparian

	1.00	2.00	R 3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceratoides lanata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kochia prostrata	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS								
Linum lewisii	5.00	5.00	0.00	0.00	10.00	0.00	0.00	0.00
Achillea millefolium	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
Artemisia ludoviciana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aster glaucodes	0.00	0.00	2.00	45.00	40.00	0.00	0.00	0.00
Descurainia pinnata	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
Epilobium halleanum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grindelia squarrosa	10.00	15.00	0.00	0.00	0.00	5.00	0.00	0.00
Hedysarum boreale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kochia scoparia	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Melilotus officinalis	0.00	0.00	3.00	0.00	0.00	10.00	25.00	15.00
Penstemon palmeri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salsola pestifer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sanguisorba minor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES								
Agropyron cristatum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromus carinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus cinereus	0.00	0.00	0.00	5.00	0.00	10.00	0.00	15.00
Elymus lanceolatus	5.00	10.00	30.00	5.00	0.00	0.00	25.00	15.00
Elymus smithii	0.00	0.00	0.00	0.00	10.00	5.00	0.00	0.00
Elymus spicatus	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus trachycaulus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hordeum jubatum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poa secunda	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER								
Total Living Cover	45.00	40.00	40.00	70.00	60.00	50.00	50.00	45.00
Litter	10.00	10.00	30.00	20.00	5.00	10.00	10.00	15.00
Bareground	35.00	35.00	5.00	5.00	25.00	30.00	35.00	30.00
Rock	10.00	15.00	25.00	5.00	10.00	10.00	5.00	10.00
% COMPOSITION								
Shrubs	33.33	0.00	0.00	0.00	0.00	40.00	0.00	0.00
Forbs	33.33	50.00	25.00	85.71	83.33	30.00	50.00	33.33
Grasses	33.33	50.00	75.00	14.29	16.67	30.00	50.00	66.67

9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
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0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	5.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	15.00	0.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00
0.00	15.00	0.00	10.00	0.00	0.00	10.00	0.00	10.00	20.00	0.00
30.00	0.00	5.00	0.00	0.00	0.00	15.00	0.00	10.00	0.00	10.00
10.00	0.00	0.00	15.00	50.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	45.00	0.00	45.00	20.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.00	25.00	75.00	55.00	60.00	50.00	40.00	50.00	60.00	50.00	70.00
25.00	20.00	5.00	30.00	30.00	40.00	50.00	5.00	30.00	10.00	15.00
10.00	10.00	10.00	10.00	5.00	5.00	5.00	40.00	5.00	15.00	5.00
10.00	45.00	10.00	5.00	5.00	5.00	5.00	5.00	5.00	25.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	57.14
9.09	40.00	73.33	54.55	16.67	10.00	12.50	10.00	8.33	20.00	14.29
90.91	60.00	26.67	45.45	83.33	90.00	87.50	90.00	66.67	80.00	28.57

20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	R 29.00	R 30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	2.00	20.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	5.00	5.00	5.00	0.00	3.00	0.00	35.00	0.00	5.00	10.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	5.00	0.00	10.00	5.00	0.00	15.00	10.00	5.00	0.00
5.00	0.00	10.00	0.00	0.00	5.00	5.00	0.00	10.00	5.00	0.00
0.00	25.00	0.00	20.00	0.00	0.00	5.00	10.00	20.00	15.00	0.00
10.00	0.00	5.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	20.00
5.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	10.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
45.00	35.00	40.00	35.00	50.00	35.00	40.00	75.00	50.00	30.00	30.00
5.00	10.00	10.00	5.00	10.00	50.00	5.00	15.00	15.00	5.00	10.00
40.00	20.00	10.00	50.00	25.00	10.00	45.00	5.00	25.00	25.00	10.00
10.00	35.00	40.00	10.00	15.00	5.00	10.00	5.00	10.00	40.00	50.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00
33.33	28.57	25.00	42.86	10.00	14.29	50.00	46.67	0.00	16.67	33.33
66.67	71.43	75.00	57.14	90.00	85.71	50.00	33.33	100.00	83.33	66.67

31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	1.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
25.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	5.00	25.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	5.00	25.00	0.00	10.00	20.00	0.00	0.00	14.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	5.00	0.00	10.00	30.00	5.00	0.00	5.00	5.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	20.00	0.00	5.00	0.00	35.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	5.00	0.00	10.00
10.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	5.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	15.00	5.00	0.00	5.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	5.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.00	20.00	35.00	55.00	35.00	40.00	65.00	35.00	45.00	50.00	35.00
15.00	5.00	5.00	10.00	10.00	5.00	20.00	5.00	10.00	10.00	10.00
10.00	20.00	5.00	25.00	40.00	15.00	5.00	15.00	35.00	25.00	20.00
15.00	55.00	55.00	10.00	15.00	40.00	10.00	45.00	10.00	15.00	35.00
50.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	55.56	52.00	42.86
16.67	75.00	14.29	63.64	85.71	62.50	38.46	42.86	11.11	28.00	14.29
33.33	25.00	85.71	27.27	14.29	37.50	61.54	57.14	33.33	20.00	42.86

42.00	R 43.00	44.00	45.00	46.00	R 47.00	48.00	49.00	50.00	51.00	52.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	15.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	10.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	5.00	10.00	0.00	0.00	5.00	12.00	15.00	30.00	30.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	15.00	0.00	20.00	5.00	0.00	0.00	0.00	25.00
5.00	5.00	15.00	0.00	5.00	0.00	10.00	5.00	10.00	0.00	10.00
10.00	10.00	5.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	10.00	0.00	15.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	25.00	45.00	60.00	50.00	40.00	45.00	40.00	40.00	30.00	65.00
10.00	10.00	5.00	10.00	20.00	5.00	15.00	5.00	10.00	15.00	10.00
20.00	20.00	35.00	20.00	15.00	40.00	25.00	45.00	35.00	30.00	5.00
20.00	45.00	15.00	10.00	15.00	15.00	15.00	10.00	15.00	25.00	20.00
0.00	0.00	33.33	0.00	80.00	0.00	11.11	0.00	0.00	0.00	7.69
60.00	20.00	22.22	16.67	10.00	25.00	55.56	50.00	75.00	100.00	23.08
40.00	80.00	44.44	83.33	10.00	75.00	33.33	50.00	25.00	0.00	69.23

53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00	63.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	20.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	50.00	10.00	5.00	5.00	0.00	65.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	10.00	0.00
5.00	10.00	0.00	20.00	25.00	20.00	5.00	0.00	5.00	0.00	10.00
5.00	25.00	10.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	5.00	0.00	10.00	0.00	25.00	35.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.00	55.00	60.00	45.00	45.00	35.00	25.00	65.00	40.00	50.00	45.00
10.00	5.00	15.00	15.00	10.00	5.00	5.00	5.00	5.00	5.00	5.00
40.00	25.00	10.00	30.00	30.00	50.00	55.00	25.00	45.00	35.00	40.00
20.00	15.00	15.00	10.00	15.00	10.00	15.00	5.00	10.00	10.00	10.00
16.67	36.36	0.00	0.00	0.00	14.29	40.00	0.00	0.00	0.00	44.44
50.00	0.00	83.33	22.22	11.11	14.29	0.00	100.00	12.50	10.00	11.11
33.33	63.64	16.67	77.78	88.89	71.43	60.00	0.00	87.50	90.00	44.44

64.00	65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00	74.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	20.00	0.00	5.00	0.00	15.00	0.00	10.00	10.00
5.00	0.00	0.00	30.00	5.00	0.00	0.00	0.00	10.00	25.00	10.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	35.00	5.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	5.00	10.00	5.00	10.00	0.00	25.00	0.00	0.00
5.00	0.00	5.00	0.00	5.00	5.00	50.00	0.00	0.00	0.00	0.00
20.00	20.00	15.00	5.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
0.00	10.00	5.00	0.00	0.00	0.00	0.00	0.00	5.00	15.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	45.00	35.00	65.00	45.00	55.00	75.00	35.00	40.00	50.00	30.00
5.00	5.00	10.00	5.00	10.00	5.00	5.00	15.00	10.00	10.00	5.00
35.00	40.00	45.00	25.00	35.00	30.00	10.00	40.00	40.00	35.00	55.00
10.00	10.00	10.00	5.00	10.00	10.00	10.00	10.00	10.00	5.00	10.00
0.00	11.11	0.00	0.00	55.56	0.00	0.00	0.00	0.00	0.00	33.33
30.00	22.22	0.00	84.62	11.11	9.09	0.00	57.14	25.00	70.00	66.67
70.00	66.67	100.00	15.38	33.33	90.91	100.00	42.86	75.00	30.00	0.00

Sowbelly
Reclaimed Area
Exposure: V
Slope: Variable

75.00	76.00	77.00	R 78.00	79.00	80.00	Mean	SDev	Freq	Sample Date
									TREES & S
0.00	0.00	0.00	0.00	0.00	0.00	0.39	1.54	7.50	*Artemisia trid*
0.00	0.00	0.00	0.00	0.00	0.00	0.44	2.98	2.50	*Atriplex cane*
0.00	0.00	0.00	0.00	0.00	0.00	0.31	1.99	2.50	*Ceratoides lanata*
0.00	10.00	0.00	0.00	5.00	0.00	3.50	8.42	21.25	*Chrysotham*
0.00	0.00	0.00	0.00	5.00	0.00	0.06	0.56	1.25	*Gutierrezia s*
0.00	0.00	0.00	0.00	0.00	0.00	0.19	1.67	1.25	*Kochia prostrata*
									FORBS
0.00	0.00	0.00	0.00	25.00	10.00	1.91	3.90	27.50	*Linum lewisii*
0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.78	2.50	*Achillea mille*
50.00	15.00	0.00	0.00	5.00	0.00	1.00	5.83	6.25	*Artemisia lud*
0.00	45.00	0.00	30.00	0.00	0.00	4.73	11.33	23.75	*Aster glaucodes*
0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	*Descurainia*
0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	*Epilobium hal*
0.00	0.00	0.00	0.00	0.00	0.00	0.44	2.12	5.00	*Grindelia squ*
0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	*Hedysarum*
0.00	0.00	50.00	0.00	0.00	0.00	1.63	6.46	10.00	*Kochia scoparia*
10.00	0.00	0.00	0.00	0.00	0.00	7.48	11.59	60.00	*Melilotus offi*
0.00	0.00	0.00	0.00	0.00	5.00	0.44	1.62	7.50	*Penstemon*
0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	*Salsola pestifer*
0.00	0.00	0.00	0.00	0.00	0.00	0.13	1.11	1.25	*Sanguisorba*
									GRASSES
0.00	0.00	0.00	0.00	0.00	0.00	0.38	1.73	5.00	*Agropyron cr*
0.00	0.00	0.00	0.00	0.00	0.00	0.19	1.24	2.50	*Bromus carinatus*
0.00	0.00	0.00	0.00	0.00	5.00	3.88	7.42	33.75	*Elymus cinereus*
10.00	5.00	0.00	0.00	0.00	0.00	5.88	7.11	56.25	*Elymus lanc*
0.00	0.00	0.00	0.00	0.00	0.00	5.06	8.82	38.75	*Elymus smithii*
0.00	0.00	0.00	25.00	0.00	0.00	5.00	9.05	35.00	*Elymus spicatus*
0.00	0.00	0.00	0.00	0.00	0.00	1.75	7.79	6.25	*Elymus trach*
0.00	0.00	0.00	0.00	0.00	0.00	0.13	1.11	1.25	*Hordeum jub*
0.00	0.00	0.00	0.00	5.00	40.00	1.81	5.43	17.50	*Poa secunda*
0.00	0.00	0.00	0.00	0.00	0.00	0.38	1.73	5.00	*Stipa hymen*
									COVER
70.00	75.00	50.00	55.00	45.00	60.00	47.44	12.92		Total Living
2.00	5.00	5.00	5.00	5.00	10.00	11.65	9.48		Litter
3.00	15.00	35.00	30.00	35.00	20.00	25.04	14.08		Bareground
25.00	5.00	10.00	10.00	15.00	10.00	15.88	12.47		Rock
									% COMPOS
0.00	13.33	0.00	0.00	22.22	0.00	10.06	18.44		Shrubs
85.71	80.00	100.00	54.55	66.67	25.00	37.16	27.88		Forbs
14.29	6.67	0.00	45.45	11.11	75.00	52.79	28.58		Grasses

Sowbelly Reference Area
AML Reclaimed Site R = Riparian
Exposure: Variable
Slope: Variable

Sample Date: 23 Aug '00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00
Atriplex canescens	10.00	20.00	0.00	20.00	15.00	25.00	5.00	15.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
FORBS								
Artemisia ludoviciana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aster glaucodes	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
Descurainia pinnata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grindelia squarrosa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medicago sativa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES								
Bromus tectorum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dactylis glomerata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus hispidus	0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00
Elymus lanceolatus	25.00	0.00	5.00	10.00	0.00	10.00	0.00	0.00
Elymus salinus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus smithii	0.00	30.00	20.00	30.00	40.00	30.00	25.00	20.00
Elymus spicatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poa secunda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER								
Total Living Cover	35.00	50.00	40.00	60.00	65.00	65.00	35.00	40.00
Litter	20.00	40.00	45.00	25.00	20.00	20.00	10.00	15.00
Bareground	5.00	5.00	5.00	5.00	5.00	5.00	45.00	35.00
Crypto	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rock	40.00	5.00	10.00	10.00	10.00	10.00	10.00	10.00
% COMPOSITION								
Shrubs	28.57	40.00	0.00	33.33	30.77	38.46	28.57	50.00
Forbs	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00
Grasses	71.43	60.00	75.00	66.67	69.23	61.54	71.43	50.00

9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	25.00	10.00	0.00	10.00	15.00	10.00	0.00	0.00	15.00	20.00
0.00	5.00	0.00	0.00	0.00	35.00	0.00	30.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	15.00	10.00	5.00	5.00	0.00	10.00	10.00	0.00	5.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	20.00	10.00	15.00	15.00	20.00	40.00	30.00	5.00	25.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.00	65.00	30.00	25.00	35.00	70.00	60.00	70.00	30.00	45.00	45.00
10.00	20.00	10.00	10.00	5.00	20.00	30.00	20.00	5.00	35.00	35.00
35.00	10.00	35.00	15.00	5.00	5.00	5.00	5.00	40.00	5.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	5.00	25.00	50.00	55.00	5.00	5.00	5.00	25.00	15.00	15.00
16.67	46.15	33.33	0.00	28.57	71.43	16.67	42.86	16.67	33.33	44.44
0.00	0.00	0.00	20.00	14.29	0.00	0.00	0.00	50.00	0.00	0.00
83.33	53.85	66.67	80.00	57.14	28.57	83.33	57.14	33.33	66.67	55.56

R

20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	5.00	5.00	30.00	0.00	20.00	5.00	0.00	0.00	20.00
5.00	10.00	5.00	0.00	15.00	25.00	0.00	15.00	20.00	25.00	0.00
0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	15.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	35.00	0.00	5.00	35.00	25.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00
30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	50.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00
70.00	50.00	35.00	55.00	60.00	60.00	60.00	40.00	55.00	60.00	70.00
20.00	25.00	45.00	30.00	20.00	30.00	15.00	10.00	15.00	25.00	15.00
5.00	10.00	10.00	5.00	10.00	5.00	5.00	5.00	5.00	10.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	15.00	10.00	10.00	10.00	5.00	20.00	45.00	25.00	5.00	10.00
42.86	20.00	14.29	9.09	50.00	0.00	33.33	12.50	0.00	0.00	28.57
7.14	70.00	14.29	0.00	25.00	41.67	0.00	37.50	36.36	41.67	0.00
50.00	10.00	71.43	90.91	25.00	58.33	66.67	50.00	63.64	58.33	71.43

31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	Mean
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25
10.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	5.00	0.00	5.38
20.00	5.00	15.00	0.00	15.00	0.00	15.00	15.00	15.00	15.00	6.25
25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38
0.00	10.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
0.00	40.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	1.88
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
5.00	0.00	10.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	6.50
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25
10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.38
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
0.00	15.00	10.00	25.00	35.00	5.00	10.00	15.00	25.00	40.00	6.25
70.00	70.00	35.00	35.00	50.00	35.00	30.00	35.00	45.00	55.00	49.25
25.00	20.00	10.00	45.00	40.00	20.00	10.00	20.00	20.00	15.00	21.75
4.00	9.00	15.00	5.00	5.00	5.00	10.00	10.00	10.00	5.00	10.70
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.13
1.00	1.00	40.00	15.00	5.00	40.00	50.00	35.00	25.00	25.00	18.30
14.29	0.00	0.00	0.00	0.00	71.43	0.00	0.00	11.11	0.00	22.68
64.29	21.43	42.86	14.29	30.00	0.00	50.00	42.86	33.33	27.27	17.73
21.43	78.57	57.14	85.71	70.00	28.57	50.00	57.14	55.56	72.73	59.59

Sowbelly Reference Area
AML Reclaimed Site
Exposure: Variable
Slope: Variable
Sample Date: 23 Aug ' 00

SDev	Freq	
		TREES & SHRUBS
1.09	5.00	*Artemisia tridentata*
8.86	40.00	*Atriplex canescens*
9.58	37.50	*Chrysothamnus nauseosus*
		FORBS
8.20	42.50	*Artemisia ludoviciana*
5.12	7.50	*Aster glaucodes*
1.73	5.00	*Descurainia pinnata*
0.78	2.50	*Grindelia squarrosa*
1.09	5.00	*Medicago sativa*
		GRASSES
6.77	12.50	*Bromus tectorum*
2.45	5.00	*Dactylis glomerata*
1.87	7.50	*Elymus hispidus*
9.10	55.00	*Elymus lanceolatus*
7.81	2.50	*Elymus salinus*
12.89	52.50	*Elymus smithii*
0.78	2.50	*Elymus spicatus*
3.90	2.50	*Poa secunda*
12.18	30.00	*Stipa hymenoides*
		COVER
14.25		Total Living Cover
10.81		Litter
10.77		Bareground
0.78		Crypto
14.96		Rock
		% COMPOSITION
20.09		Shrubs
20.53		Forbs
18.13		Grasses

Appendix 2

Phase II Bond Release
Sediment Yield Calculations
Sowbelly Canyon

Phase II Bond Release Sediment Yield Calculation
- Sawbelly Canyon -

The purpose of these calculations is to demonstrate that the reclaimed areas in Sawbelly Canyon will generate the same amount of or less sediment than the same site assuming undisturbed conditions.

To do this the Revised Universal Soil Loss Equation ("RUSLE) will be used.

Although the vegetation at the reclaimed site is fairly uniform there are other factors which affect the sediment yield for the site. For example not all of reclaimed area was ganged. To account for the variation the sediment yield will be calculated under four conditions.

1) Assume the reclaimed area under undisturbed conditions. The site is Pre-SMCRA and good Pre-mining topo does not exist thus, the reclaimed slopes will be used since pre-mining slopes are unavailable. However, this will result in an overall conservative estimate since natural slopes are generally steeper (more erosive) than the reclaimed slopes.

2) Worst case in ganged area

3) Ave sediment yield in ganged areas.

4) Sediment yield in none ganged areas.

$$A = R \cdot K \cdot LS \cdot C \cdot P$$

A = Sediment yield (tons/acre/yr)

R = Rainfall-Runoff erosivity factor (-)

K = Soil erodibility factor (-)

LS = Length-slope factor (-)

C = Cover management factor

P = Support practice factor.

Rainfall factor (R)

This factor will be the same for all four conditions.

R = 11 (Map R7 : Israelsen et. al. (1984)

Soil erodibility factor (K)

This factor is the same for all four conditions.

Soil samples taken near the surface in Appendix 3.2B give an average gradation of

Sand = 43%
Silt = 36%
Clay = 21%

The nomograph to be used to determin K needs the percentage of silt and very fine sand. However no analysis for very fine sand was made. Therefore Assume 5% very fine sand

OM = 1.6% However Assume 0% since this may have been determined from O.C.
└ Ave of 6 samples analyzed by Imbl in 1993 (Appendix 3.2B)

Assume Silt + very fine sand = 41%
Sand = 38%

K = 0.31

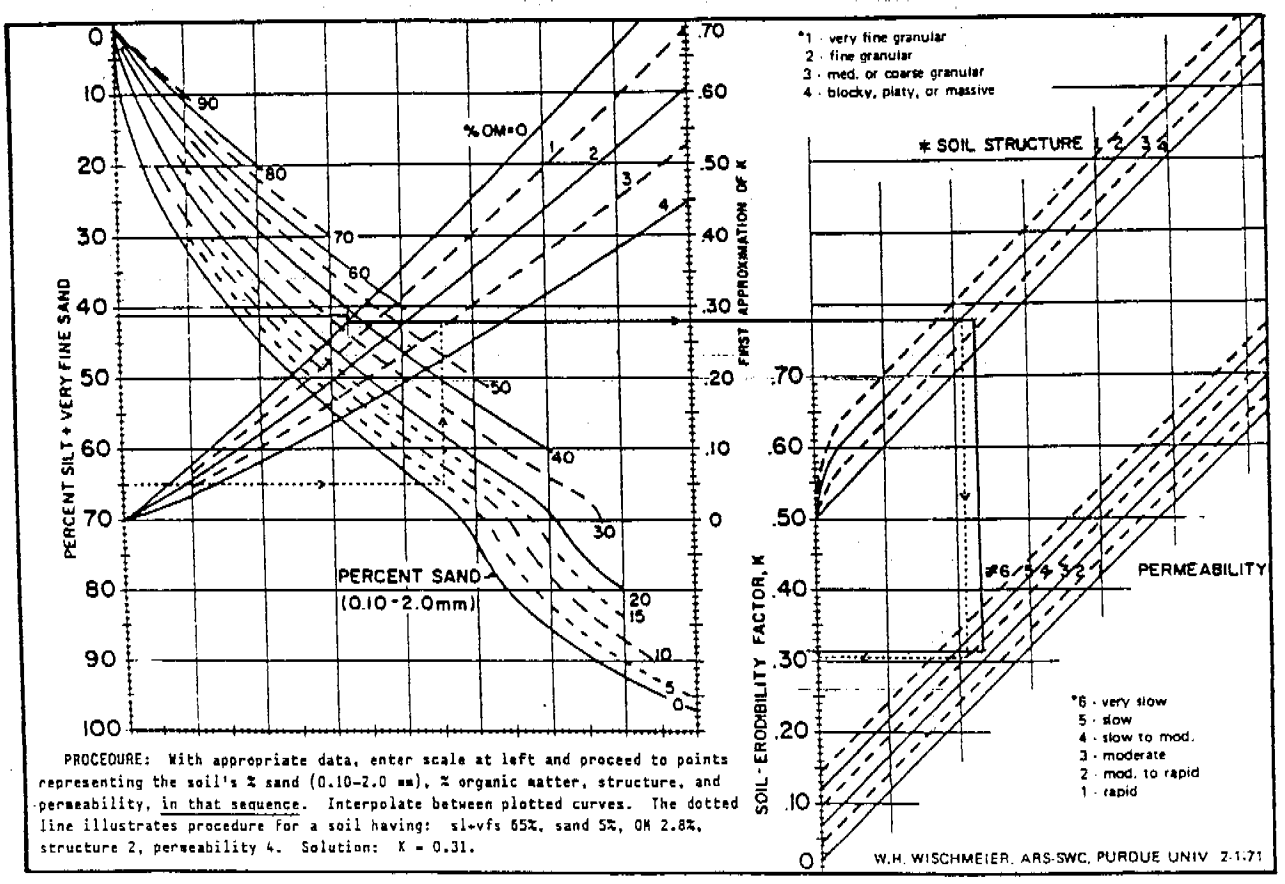

Figure 2. Nomograph for determining soil erodibility factor K.

Length - slope factor (LS)

The average slope for the reclaimed area can be calculated using the equation Ave slope = (Contour length)(contour interval)/(Area)

Ave slope = $\frac{(13,750 \text{ ft})(10 \text{ ft})}{792,792} = 0.173$ round up to a slope of 20%

The Length will vary for each of the four conditions. The length is the distance water travels before reaching an established channel or something that stops the flow such as a berm or depression.

Condition 1

The average flow distance over the disturbed area is Approximately 150'

$L = 150$

$LS = 5.0$ Table 4-1 Renard et.al (1997)

Condition 2

During a site visit the greatest distance water could flow before hitting a depression is 45'

$L = 45'$

$LS = 2.74$ Table 4-1 Renard et.al (1997)

Condition 3

The average distance between depressions in the ganged area is 20'

$L = 20'$

$LS = 1.82$ Table 4-1 Renard et.al. (1997)

Condition 4

The maximum flow distance over reclaimed non ganged areas is 120'

$L = 120'$

$LS = 4.47$

Cover Management factor (C)

Reference area

Vegetative Cover = 49.25

of the vegetation cover
grasses = 59.6 %
shrubs = 22.7 %
forbs = 17.7 %

Litter = 21.75 %
Rock = 18.30 %
Bareground = 10.70 %

Total Cover = 89.3 %

Reclamation Area

Vegetative Cover = 47.44 %

grasses = 52.79
Forbs = 37.16
Shrubs = 10.06

Litter = 11.65
Rock = 15.88
Bareground = 25.04

Total cover = 74.96 %

Condition 1 (Assume reference area conditions)

Cover that contacts the surface = 49.25 + 18.30 = 67.6 % *

C = 0.031 Interpolated from Table 8B.2 (Pg 6) No appreciable canopy

Condition 2-4

Cover that contacts the surface = 47.44 + 15.88 = 63.3 %

C = 0.037 Table 8B.2 (Pg 6)

* Table 8B.2 Assumes that litter is only considered to be ground cover if the litter is over 2" deep. Which is not the case here.

Support Practice (P)

The support practice factor accounts for the regular working or tillage of the soil. Since the reclaimed area is to be left undisturbed. This factor of the RUSLE is not applicable to this site.

$\therefore$ P = 1 for all conditions.

Summary

Condition	R	K	LS	C	P	A (tons/acre/yr)
1	11	0.31	5.0	0.031	1	0.53
2	11	0.31	2.74	0.037	1	0.35
3	11	0.31	1.82	0.037	1	0.23
4	11	0.31	4.47	0.037	1	0.56

The gouged areas produce less sediment than the undisturbed areas. Until the litter builds up with more growing seasons the non-gouged areas produce a little more sediment. However, as shown on Exhibit 3.2-13 the non gouged areas are a small part of the total reclamation. Also, Runoff from non-gouged areas must flow through gouged areas. Thus the runoff will be stopped by the depressions and any additional sediment will drop out in the depression.

Total Reclaimed area = 18.2 acres
Total gouged = 14.47 acres
Total non-gouged = 3.73 acres.

Sediment Yield assuming condition 1 = (0.53 X 18.2) = 9.65 tons/yr

Sediment Yield from gouged area with Ave spacing = (0.23)(14.47) = 3.33 tons/yr

Sediment yield assuming condition 4 = (0.56 X 3.73) = 2.09 tons/yr

Undisturbed = 9.65 tons/yr > Reclaimed = 5.42 tons/yr

4.23 tons/yr less sediment generated by reclaimed site.

Table 8B.2 *C* Factors for Permanent Pasture, Rangeland, Idle Land, and Grazed Woodlands (after Wischmeier and Smith, 1978)[a]

Vegetal canopy			Cover that contacts the surface Percentage ground cover					
Type and height of raised canopy[b]	Canopy cover (%)	Type[d]	0	20	40	60	80	95–100
No appreciable canopy		G	0.45	0.20	0.10	0.042	0.013	0.003
		W	0.45	0.24	0.15	0.090	0.043	0.011
Canopy of tall weeds or	25	G	0.36	0.17	0.09	0.038	0.012	0.003
short brush (0.5-m fall height)		W	0.36	0.20	0.13	0.082	0.041	0.011
	50	G	0.26	0.13	0.07	0.035	0.012	0.003
		W	0.26	0.16	0.11	0.075	0.039	0.011
	75	G	0.17	0.10	0.06	0.031	0.011	0.003
		W	0.17	0.12	0.09	0.067	0.038	0.011
Appreciable brush or bushes	25	G	0.40	0.18	0.09	0.040	0.013	0.003
(2-m fall height)		W	0.40	0.22	0.14	0.085	0.042	0.011
	50	G	0.34	0.16	0.085	0.038	0.012	0.003
		W	0.34	0.19	0.13	0.081	0.041	0.011
	75	G	0.28	0.14	0.08	0.036	0.012	0.003
		W	0.28	0.17	0.12	0.077	0.040	0.011
Trees, but no appreciable	25	G	0.42	0.19	0.10	0.041	0.013	0.003
low brush (4-m fall height)		W	0.42	0.23	0.14	0.087	0.042	0.011
	50	G	0.39	0.18	0.09	0.040	0.013	0.003
		W	0.39	0.21	0.14	0.085	0.042	0.011
	75	G	0.36	0.17	0.09	0.039	0.012	0.003
		W	0.36	0.20	0.13	0.083	0.041	0.011

[a]All values shown assume: (1) random distribution of mulch or vegetation and (2) mulch of appreciable depth where it exists. Idle land refers to land with undisturbed profiles for at least a period of 3 consecutive years. Also to be used for burned forest land and forest land that has been harvested less than 3 years ago.

[b]Average fall height of waterdrops from canopy to soil surface in meters.

[c]Portion of total surface area that would be hidden from view by canopy in a vertical projection (a bird's-eye view).

[d]G, cover at surface is grass, grasslike plants, decaying compacted duff, or litter at least 2 in. deep. W, cover at surface is mostly broadleaf herbaceous plants (as weeds with little lateral root network near the surface) and/or undecayed residue.

References

Barfield, B.J., R.C. Warner, and C.T. Haan. 1983 Applied Hydrology and Sedimentology for Disturbed Areas. Oklahoma Technical Press, Stillwater Oklahoma

Collins, P. 2000 Vegetation Monitoring for Phase II Bond Release in Sowbelly Canyon. Mt. Nebo Scientific. Springville, UT

Israelsen, C.E., J.E. Fletcher, F.W. Haws, and E.K. Israelsen 1984 Erosion and sedimentation in Utah A Guide for Control Utah Water Research Lab. UTAH State University. Logan. UT

Renard. K.G., G.R. Foster, G.A. Weesies, D.K. McCool and D.C. Yoder, 1997 Predicting Soil Erosion by Water: A Guide to Conservation Planning with the RUSLE. U.S. Government Printing Office. Washington, D.C.

Appendix 3

Public Notice

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Carbon,)

I, Ken Larson, on oath, say that I am the Publisher of the Sun Advocate, a twice-weekly newspaper of general circulation, published at Price, State a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 16th day of July, 2002, and that the last publication of such notice was in the issue of such newspaper dated the 6th day of August, 2002.

Ken G. Larson

Ken G Larson - Publisher

Subscribed and sworn to before me this 6th day of August, 2002.

Linda Thayn

Notary Public My commission expires January 10, 2003 Residing at Price, Utah

Publication fee, $ 501.76

LINDA THAYN
NOTARY PUBLIC • STATE of UTAH
845 EAST MAIN
PRICE, UTAH 84501
COMM. EXP. 1-10-2003

PUBLIC NOTICE

APPLICATION FOR PHASE II BOND RELEASE
SOWBELLY GULCH NO. 5 MINE
CASTLE GATE HOLDING COMPANY
CASTLE GATE MINE
PERMIT C/007/004, APPROVED 12/24/94
CARBON COUNTY, UTAH

Castle Gate Holding Company, 999 Corporate Blvd., Linthicum Heights, MD 21090, has completed Phase II of the approved reclamation plan for Sowbelly Gulch No. 5 Mine area of the Castle Gate Mine. This is based on meeting the vegetation and water quality requirements for Phase II reclamation in accordance with the approved reclamation plan. The reclamation of 18.2 acres of Sowbelly Gulch was completed in 1995.

In accordance with the provisions of R645-301-880, of the State of Utah R645-Coal Mining Rules, notice is hereby given to the general public that Castle Gate Holding Company is applying for partial release of the performance bond posted for this operation.

The surety bond posted for the Castle Gate Mine is $1,071,000 of which $369,946 is designated for the Sowbelly Gulch reclamation. Castle Gate Holding Company is seeking release of $136,946 from the Sowbelly Gulch portion of the bond. All earthwork and revegetation has been completed on site, except for the removal of an electrical substation and access road. Reclamation of these areas will be completed when transmission of power from the substation is no longer necessary.

The Sowbelly Gulch No. 5 Mine is located on the Standardville, Utah, U.S. Geological Survey 7.5 minute quadrangle map. The mine site is located in Sowbelly Gulch, approximately 4 miles west-northwest of Helper, Utah. Reclamation work was performed on approximately 18.2 acres of disturbed and affected area located on the following described lands:

Township 13 South, Range 9 East, SLB&M, Utah
Section 4: NW1/4 SW1/4, SW1/4SW1/4
Section 9: NW1/4NW1/4

The Utah Division of Oil, Gas and Mining will now evaluate the proposal to determine whether it meets all the criteria of the Permanent Program Performance Standards according to the requirements of the Utah Coal Mining Rules.

Written comments, objections and requests for public hearing or information conference on this proposal may be addressed to:

Utah Coal Program
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Closing date for submission of such comments, objections and requests for public hearing or information conference on this proposal must be submitted by September 5, 2002.

Published in the Sun Advocate July 16, 23, 30 and August 6, 2002.

Appendix 4

Letters

PLATEAU
MINING
CORPORATION

Willow Creek Mine
847 NW Hwy 191
Helper, Utah 84526
(435) 472-0475
Fax: (435) 472-4780
An affiliate of RAG

May 3, 2002

Mr. Kenneth E. McDonough
Real Estate Counsel
American Electric Power Service Corp.
One Riverside Plaza
Columbus, Ohio 54215

Re: Notification of Application for Phase II Bond Release, Sowbelly Gulch No. 5 Mine, Castle Gate Holding Company, Castle Gate Mine, C/007/004, Carbon County, Utah

Dear Mr. McDonough:

Castle Gate Holding Company has completed Phase II of the approved reclamation plan for the Sowbelly Gulch No. 5 Mine area of the Castle Gate Mine. This is based on meeting the vegetation and water quality requirements for Phase II reclamation in accordance with the approved reclamation plan.

In accordance with the provisions of R645-301-880 of the State of Utah R645 Coal Mining Rules, this letter will serve as notification that Castle Gate Holding Company intends to file an application with the Utah Division of Oil, Gas and Mining for partial release of the performance bond posted for this operation.

The surety bond posted for the Castle Gate Mine is $1,071,000 of which $369,946 is designated for the Sowbelly Gulch reclamation. Castle Gate Holding Company is seeking release of $136,946 from the Sowbelly Gulch portion of the bond. All earthwork and revegetation has been completed on site, except for the removal of an electrical substation and access road. These areas will be reclaimed when power transmission is no longer deemed necessary.

Comments concerning Phase II bond release from the legal or equitable owner of record of the surface areas to be affected and from the Federal, Utah and local government agencies which would have to initiate, implement, approve, or authorize the proposed use of the land following reclamation should be mailed to: Plateau Mining Corporation, Attention: Johnny Pappas, 847 NW Highway 191, Helper, Utah 84526.

If you have any questions or need additional information, please do not hesitate to contact me at (435) 472-4741.

Sincerely,

Johnny Pappas
Sr. Environmental Engineer

Env: Sowbelly Gulch No. 5 Mine-Phase II Bond Release
Chrono: JP020403.LTR

PLATEAU
MINING
CORPORATION

Willow Creek Mine
847 NW Hwy 191
Helper, Utah 84526
(435) 472-0475
Fax: (435) 472-4780
An affiliate of RAG

May 3, 2002

Mr. Mark Mackiewicz
Bureau of Land Management
125 South 600 West
Price, Utah 84501

Re: Notification of Application for Phase II Bond Release, Sowbelly Gulch No. 5 Mine, Castle Gate Holding Company, Castle Gate Mine, C/007/004, Carbon County, Utah

Dear Mr. Mackiewicz:

Castle Gate Holding Company has completed Phase II of the approved reclamation plan for the Sowbelly Gulch No. 5 Mine area of the Castle Gate Mine. This is based on meeting the vegetation and water quality requirements for Phase II reclamation in accordance with the approved reclamation plan.

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If you have any questions or need additional information, please do not hesitate to contact me at (435) 472-4741.

Sincerely,

Johnny Pappas
Sr. Environmental Engineer

Env: Sowbelly Gulch No. 5 Mine-Phase II Bond Release
Chrono: JP020405.LTR

PLATEAU
MINING
CORPORATION

Willow Creek Mine
847 NW Hwy 191
Helper, Utah 84526
(435) 472-0475
Fax: (435) 472-4780
An affiliate of RAG

May 3, 2002

Mr. William D. Krompel
Commissioner
120 East Main Street
Price, Utah 84501

Re: Notification of Application for Phase II Bond Release, Sowbelly Gulch No. 5 Mine, Castle Gate Holding Company, Castle Gate Mine, C/007/004, Carbon County, Utah

Dear Mr. Krompel:

Castle Gate Holding Company has completed Phase II of the approved reclamation plan for the Sowbelly Gulch No. 5 Mine area of the Castle Gate Mine. This is based on meeting the vegetation and water quality requirements for Phase II reclamation in accordance with the approved reclamation plan.

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If you have any questions or need additional information, please do not hesitate to contact me at (435) 472-4741.

Sincerely,

Johnny Pappas
Sr. Environmental Engineer

Env: Sowbelly Gulch No. 5 Mine-Phase II Bond Release
Chrono: JP020406.LTR

PLATEAU
MINING
CORPORATION

Willow Creek Mine
847 NW Hwy 191
Helper, Utah 84526
(435) 472-0475
Fax: (435) 472-4780
An affiliate of RAG

May 3, 2002

Mr. Gary Harwood
Helper City
P.O. Box 221
Helper, Utah 84526

Re: Notification of Application for Phase II Bond Release, Sowbelly Gulch No. 5 Mine, Castle Gate Holding Company, Castle Gate Mine, C/007/004, Carbon County, Utah

Dear Mr. Harwood:

Castle Gate Holding Company has completed Phase II of the approved reclamation plan for the Sowbelly Gulch No. 5 Mine area of the Castle Gate Mine. This is based on meeting the vegetation and water quality requirements for Phase II reclamation in accordance with the approved reclamation plan.

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If you have any questions or need additional information, please do not hesitate to contact me at (435) 472-4741.

Sincerely,

Johnny Pappas
Sr. Environmental Engineer

Env: Sowbelly Gulch No. 5 Mine-Phase II Bond Release
Chrono: JP020407.LTR

PLATEAU
MINING
CORPORATION

Willow Creek Mine
847 NW Hwy 191
Helper, Utah 84526
(435) 472-0475
Fax: (435) 472-4780
An affiliate of RAG

May 3, 2002

Mr. Ray Hanson
Carbon County Road Department
120 East Main Street
Price, Utah 84501

Re: Notification of Application for Phase II Bond Release, Sowbelly Gulch No. 5 Mine, Castle Gate Holding Company, Castle Gate Mine, C/007/004, Carbon County, Utah

Dear Mr. Hanson:

Castle Gate Holding Company has completed Phase II of the approved reclamation plan for the Sowbelly Gulch No. 5 Mine area of the Castle Gate Mine. This is based on meeting the vegetation and water quality requirements for Phase II reclamation in accordance with the approved reclamation plan.

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If you have any questions or need additional information, please do not hesitate to contact me at (435) 472-4741.

Sincerely,

Johnny Pappas
Sr. Environmental Engineer

Env: Sowbelly Gulch No. 5 Mine-Phase II Bond Release
Chrono: JP020408.LTR

Willow Creek Mine
847 NW Hwy 191
Helper, Utah 84526
(435) 472-0475
Fax: (435) 472-4780

PLATEAU MINING CORPORATION

An affiliate of RAG

May 3, 2002

Mr. Dave Levanger
Carbon County Planning and Zoning
120 East Main Street
Price, Utah 84501

Re: Notification of Application for Phase II Bond Release, Sowbelly Gulch No. 5 Mine, Castle Gate Holding Company, Castle Gate Mine, C/007/004, Carbon County, Utah

Dear Mr. Levanger:

Castle Gate Holding Company has completed Phase II of the approved reclamation plan for the Sowbelly Gulch No. 5 Mine area of the Castle Gate Mine. This is based on meeting the vegetation and water quality requirements for Phase II reclamation in accordance with the approved reclamation plan.

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If you have any questions or need additional information, please do not hesitate to contact me at (435) 472-4741.

Sincerely,

Johnny Pappas
Sr. Environmental Engineer

Env: Sowbelly Gulch No. 5 Mine-Phase II Bond Release
Chrono: JP020409.LTR

Map(s) is kept with this application located in the Public Information Center of our Salt Lake City office.

EXHIBIT 3.2-13, AS-BUILT TOPOGRAPHY AND TREATMENT MAP